

7. APPLICATION Suppose the annual rate of inflation is about 4%. This means that the cost of an item increases by about 4% each year. Write and evaluate an exponential expression to find the answers to these questions.

- If a piano costs \$3,500 today, what did it cost 4 years ago?
- If a vacuum cleaner costs \$250 today, what did the same model cost 3 years ago?
- If tickets to a college basketball game cost \$25 today, what did they cost 5 years ago?
- The median price of a house in the Midwest United States in June 2000 was \$126,800. What was the median price 30 years ago?

(National Association of Realtors)

$$y = a(1+r)^x$$

$$y = 3500(1+0.04)^{-4}$$

$$\textcircled{a} \approx 2,991.81$$

$$y = 250(1+0.04)^{-3}$$

$$\textcircled{b} \approx 222.24$$

$$\textcircled{c} y = 25(1+0.04)^{-5}$$

$$\approx 20.54$$

$$\textcircled{d} 126,800(1+0.04)^{-30}$$

$$39,054.80$$

9. Decide whether each statement is true or false. Use expanded form to show either that the statement is true or what the correct statement should be.

a. $(2^3)^2 = 2^6$ $2^6 = 2^6$ T

b. $(3^3)^4 = 3^7$ $3^{12} = 3^7$ F

c. $(10^{-2})^4 = -10^8$

d. $(5^{-3})^{-4} = 5^{12}$

$10^{-8} = -10^8$ F

$5^{12} = 5^{12}$ T

X	Y
0	64
1	48
2	36
3	27
4	20.25

$$\frac{36}{48} = 0.75$$

$$\frac{27}{36} = 0.75$$

$$\frac{20.25}{27} = 0.75$$

$$y = 64 (1 - 0.25)^x$$

$$y = 64 (0.75)^x$$

$$y = 64 (0.75)^4 = 20.25$$

$$y = ab^x$$

↓
multiplier

$$y = a(1 - \downarrow)^x$$

(1 - 0.25)

Note name	Note above middle C	Frequency (Hz)
Middle C	0	262
C#	1	277
D	2	294
D#	3	311
E	4	330
F	5	349
F#	6	370
G	7	392
G#	8	415
A	9	440
A#	10	466
B	11	494
C above middle C	12	523

$$\text{avg} = 1.0593$$

$$y = 262(1.0593)^x$$

$$\begin{aligned} &> 1.0587 \\ &> 1.060 \\ &> 1.0590 \\ &> 1.0600 \\ &> 1.0587 \end{aligned}$$

7.7 #1-7

1.15

$(1 + 0.15)$, 15%